



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/649,012	08/27/2003	Noboru Taniguchi	10873.812USC1	5937
7590 06/05/2007 Hamre, Schumann, Mueller & Larson, P.C. P.O. Box 2902-0902 Minneapolis, MN 55402			EXAMINER VATHYAM, SUREKHA	
			ART UNIT 1753	PAPER NUMBER
			MAIL DATE 06/05/2007	DELIVERY MODE PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

## Office Action Summary

Application No.

10/649,012

Applicant(s)

TANIGUCHI, NOBORU

Examiner

Surekha Vathyam

Art Unit

1753

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 08 May 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1,3 and 14 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,3 and 14 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☒ Certified copies of the priority documents have been received in Application No. 09/976196.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                     | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Continued Examination Under 37 CFR 1.114***

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 8 May 2007 has been entered.

### ***Claim Rejections - 35 USC § 112***

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claim 1 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. There is no support for the limitation "at least part of the Al is present in the at least one electrode as at least one selected from the group consisting of elemental aluminum and aluminum oxide". "[I]t cannot be said that such a subgenus is necessarily described by a genus encompassing it and a species upon which it reads." *In re Smith*, 173 USPQ 679, 683 (CCPA 1972).

Art Unit: 1753

4. Claim 3 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. There is no support for the new limitation "X is at least 0.6 and less than 1". There is no basis for artificially excluding the number "1". "[I]t cannot be said that such a subgenus is necessarily described by a genus encompassing it and a species upon which it reads." *In re Smith*, 173 USPQ 679, 683 (CCPA 1972)

***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

7. Claims 1, 3 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over EP 1 041 380 A2.

Regarding claim 1, EP '380 discloses a hydrocarbon sensor (see col. 1, lines 5-6) comprising a substrate (1) made of a solid electrolyte (column 8, lines 41 – 48) that conducts protons (see col. 9, lines 37-44), and a pair of electrodes (2 and 3) formed on the substrate (see figs. 1A and 1B), wherein at least one electrode of the pair of electrodes contains Au and Al (column 3, line 52 – column 4, line 6), at least part of the Al is present in the at least one electrode as at least one selected from the group consisting of elemental aluminum and aluminum oxide (see fig. 3 and column 11, lines 7 – 12), at least one of the elemental aluminum and aluminum oxide is contained in a mixed state in the at least one electrode (column 6, lines 37 – 41 and see fig. 3 and column 11, lines 7 – 38).

EP '380 does not explicitly disclose the recited percentages of Au and Al but recognizes the percentages of Au and Al to be variables for optimization (column 6, line 49 – column 7, line 3).

It would have been obvious to one of ordinary skill in the art to have optimized the recognized result effective variable as taught by EP '380 (column 6, line 49 – column 7, line 3). As held in *In re Aller* 105 USPQ 233, 235 (CCPA 1955), "where the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation".

Regarding claim 3, EP '380 discloses the hydrocarbon sensor wherein the at least one electrode contains  $\text{AuAl}_2$  (column 7, lines 9 – 18) and elemental Au (column 6, lines 49 – 52).

EP '380 does not explicitly disclose the recited molar ratio of  $\text{AuAl}_2$  and Au but recognizes the amount of  $\text{AuAl}_2$  and Au to be variables for optimization (column 7, lines 9 – 18 and column 6, lines 49 – 52).

It would have been obvious to one of ordinary skill in the art to have optimized the recognized result effective variable as taught by EP '380 (column 7, lines 9 – 18 and column 6, lines 49 – 52). As held in *In re Aller* 105 USPQ 233, 235 (CCPA 1955), “where the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation”.

Regarding claim 14, EP '380 discloses the hydrocarbon sensor wherein the  $\text{AuAl}_2$  alloy and the at least one of elemental aluminum and aluminum oxide are contained in a mixed state in the at least one electrode (see fig. 3 and column 11, lines 7 – 38).

### ***Double Patenting***

8. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the “right to exclude” granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

Art Unit: 1753

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

9. Claims 1, 3 and 14 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claim 1 of U.S. Patent No. 6,638,406 in view of EP 1 041 380 A2.

Claim 1 of '406 recites "a hydrocarbon sensor comprising a substrate made of a solid electrolyte that conducts protons, a pair of electrodes formed on the substrate, ... wherein at least one electrode of the pair of electrodes contains Au and Al, ...".

Claim 1 of '406 discloses that the Al and Au are present but does not explicitly disclose that the Al is present as elemental aluminum and/or aluminum oxide in a mixed state and that the Au is present as  $\text{AuAl}_2$  and/or elemental Au. Claim 1 of '406 also does not disclose the mole percentages and ratios required by instant claims 1, 3 and 13.

Although the conflicting claims are not identical, they are not patentably distinct from each other because claim 1 of US patent No. 6,638,406 includes all the limitations of instant claims 1, 3 and 14.

Regarding claim 1, EP '380 discloses a hydrocarbon sensor (see col. 1, lines 5-6) comprising a substrate (1) made of a solid electrolyte (column 8, lines 41 – 48) that conducts protons (see col. 9, lines 37-44), and a pair of electrodes (2 and 3) formed on

Art Unit: 1753

the substrate (see figs. 1A and 1B), wherein at least one electrode of the pair of electrodes contains Au and Al (column 3, line 52 – column 4, line 6), at least part of the Al is present in the at least one electrode as at least one selected from the group consisting of elemental aluminum and aluminum oxide (see fig. 3 and column 11, lines 7 – 12), at least one of the elemental aluminum and aluminum oxide is contained in a mixed state in the at least one electrode (column 6, lines 37 – 41 and see fig. 3 and column 11, lines 7 – 38).

EP '380 does not explicitly disclose the recited percentages of Au and Al but recognizes the percentages of Au and Al to be variables for optimization (column 6, line 49 – column 7, line 3).

It would have been obvious to one of ordinary skill in the art to have optimized the recognized result effective variable as taught by EP '380 (column 6, line 49 – column 7, line 3). As held in *In re Aller* 105 USPQ 233, 235 (CCPA 1955), "where the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation".

Regarding claim 3, EP '380 discloses the hydrocarbon sensor wherein the at least one electrode contains  $\text{AuAl}_2$  (column 7, lines 9 – 18) and elemental Au (column 6, lines 49 – 52).

EP '380 does not explicitly disclose the recited molar ratio of  $\text{AuAl}_2$  and Au but recognizes the amount of  $\text{AuAl}_2$  and Au to be variables for optimization (column 7, lines 9 – 18 and column 6, lines 49 – 52).



It would have been obvious to one of ordinary skill in the art to have optimized the recognized result effective variable as taught by EP '380 (column 7, lines 9 – 18 and column 6, lines 49 – 52). As held in *In re Aller* 105 USPQ 233, 235 (CCPA 1955), “where the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation”.

Regarding claim 14, EP '380 discloses the hydrocarbon sensor wherein the  $\text{AuAl}_2$  alloy and the at least one of elemental aluminum and aluminum oxide are contained in a mixed state in the at least one electrode (see fig. 3 and column 11, lines 7 – 38).

### ***Response to Arguments***

10. Applicant's arguments filed 8 May 2007 have been fully considered but they are not persuasive. Regarding the rejection of claim 1 under 35 USC 112, first paragraph, applicant argues that, “presence of **both** elemental aluminum and aluminum oxide in the electrode is clearly described in the specification” (emphasis added). However the claim limitation, “at least part of the Al is present in the at least one electrode as at least one selected from the group consisting of elemental aluminum and aluminum oxide”, encompasses within the scope of the claim, the presence of Al in the electrode as aluminum oxide **alone**, which does not find support in the specification. Regarding the rejection of claim 3 under 35 USC 112, first paragraph, applicant argues that support for the limitation, “ $\text{AuAl}_2 : \text{Au} = X : 1-X$ , where X is at least 0.6 and **less than 1**” is found in

Art Unit: 1753

page 12, lines 2 – 6 of the specification. However, the specification on page 12 refers to  $X \geq 0.6$  which **includes  $X = 1$**  and on page 6, lines 25 – 27, " $0.6 \leq \underline{X} \leq 1$ " is disclosed. Applicant further remarks, "when X is "1", then as shown in No. 16...Table 1". However, No. 16 of Table 1 shows  $\text{AuAl}_2 = 0$  which does not correspond to when X is "1", as when  $X = 1$ , the molar ratio of  $\text{AuAl}_2 : \text{Au} = 1 : 0$ , i.e.,  $\text{Au} = 0$ . Regarding the rejection of claims 1 and 3 under 35 USC 103, applicant's remarks are not persuasive that EP '380 "fails to teach or suggest obtaining a highly reliable hydrocarbon sensor that is resistant to heat degradation...where at least one of elemental Al and aluminum oxide are mixed therein". Applicant's arguments regarding high reliability and resistance to heat degradation do not relate to claim limitations. EP '380 discloses the presence of at least one of elemental Al and aluminum oxide in a mixed state along with  $\text{AuAl}_2$  (see fig. 3 and column 11, lines 7 – 38). The American Heritage Dictionary (Second College Edition) definition of an alloy is "a homogeneous mixture or solid solution, usually of two or more metals, the atoms of one replacing or occupying interstitial positions between the atoms of the other". The alloy of EP '380 by definition is in a mixed state. The obviousness double patenting over US 6,638,406 in view of EP '380 is maintained in light of the rejection discussed above.


### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Surekha Vathyam whose telephone number is 571-272-2682. The examiner can normally be reached on 7:30 AM to 4:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam X. Nguyen can be reached on 571-272-1342. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

SV  
May 17, 2007



NAM NGUYEN  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 1700